

CLAIMS:

1. A vehicle wheel information processing device comprising:

a plurality of vehicle wheel communication devices which are provided at a single vehicle wheel and which are not connected to each other; and

a vehicle body communication device that communicates wirelessly with the plurality of vehicle wheel communication devices, wherein

a transmission pattern of a signal transmitted from each of the vehicle wheel communication devices is set to be different to the transmission pattern of each other signal in such a manner that the signals of two or more vehicle wheel communication devices do not overlap each other, when requested at the same time.

2. The vehicle wheel information processing device according to claim 1, wherein,

each vehicle wheel communication device comprises a detection sensor.

3. The vehicle wheel information processing device according to claim 1 or claim 2, wherein

the plurality of vehicle wheel communication devices transmit the respective signals as respective return signals in response to a request signal from the vehicle body communication device.

4. The vehicle wheel information processing device according to claim 3, wherein

a transmission start timing for the each return signal transmitted in response to the request signal is set to be different for each vehicle wheel communication device.

5. The vehicle wheel information processing device according to claim 3, wherein

each vehicle wheel communication device transmits the return signal

a plurality of times, and

a transmission cycle of each return signal is set to be different for each vehicle wheel communication device.

5 6. The vehicle wheel information processing device according to claim 3, wherein

each vehicle wheel communication device transmits the return signal a plurality of times, and

10 a transmission interval of each return signal is set at random such that the respective transmission intervals of the vehicle wheel communication devices are mutually different.

7. The vehicle wheel information processing device according to any one of claims 1 to 6, wherein

15 each signal having a individual identification number of the vehicle wheel communication device, the respective identification numbers for each of the vehicle wheel communication devices being mutually different, and

20 each vehicle wheel communication device transmits the signal including the identification number thereof to the vehicle body communication device.

the vehicle body communication device transmits a request signal including at least one of the identification numbers to the vehicle wheel communication devices, and

25 each of the vehicle wheel communication devices is configured to transmit a return signal to the vehicle body communication device in the case that its individual identification number is included within the received request signal, whereby the transmission pattern of the signal transmitted from each of the vehicle wheel communication devices is set
30 to be different to the transmission pattern of each other signal.

8. The vehicle wheel information processing device according to claim 5, wherein

the distinguishing characteristic is a data format of each signal transmitted from each vehicle wheel communication device, the data formats of the respective signals transmitted from each vehicle wheel communication device being mutually different.

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9. The vehicle wheel information processing device according to claim 5, wherein

the distinguishing characteristic is a magnitude of a value of each signal transmitted from the each vehicle wheel communication device, the
10 respective magnitudes of the values of the respective signals transmitted from each vehicle wheel communication device being mutually different based upon an attachment position of each vehicle wheel communication device, and

the vehicle body communication device analyzes the values of the
15 signals transmitted from the respective vehicle wheel communication devices, and determines which of the signals has been transmitted from which of the vehicle wheel communication devices based upon the analysis.

20 10. The vehicle wheel information processing device according to claim 9, wherein

each vehicle wheel communication device comprises an sensor

each vehicle wheel communication device transmits a value detected
by the sensor

25 the vehicle body communication device determines which of the signals has been transmitted from which of the vehicle wheel communication devices based upon the detected values transmitted from a plurality of vehicle wheel communication devices.

30 11. The vehicle wheel information processing device according to claim 9 or claim 10, wherein

the vehicle body communication device analyses a history of each value of each signal transmitted from each vehicle wheel communication

device, and determines which of the signals has been transmitted from which of the vehicle wheel communication devices based upon the analysis.

- 5 12. The vehicle wheel information processing device according to claim 9 or claim 10, wherein

the vehicle body communication device analyses the magnitude of each value of each signal transmitted from each vehicle wheel communication device, and determines which of the signals has been
10 transmitted from which of the vehicle wheel communication devices based upon the analysis.

13. A vehicle wheel information processing device comprising:

a plurality of vehicle wheel communication devices which are
15 provided at a single vehicle wheel; and

each vehicle wheel communication device comprises a sensor,

a vehicle body communication device that communicates with the plurality of vehicle wheel communication devices, wherein

the plurality of vehicle wheel communication devices include a first
20 vehicle wheel communication device that directly and wirelessly communicates with the vehicle body communication device, and a second vehicle wheel communication device that wirelessly communicates with the first vehicle wheel communication device and indirectly communicates with the vehicle body communication device by using the first vehicle
25 wheel communication device as a relay,

the first vehicle wheel communication device transmits an identification number for the first vehicle wheel communication device to the vehicle body communication device,

the second vehicle wheel communication device transmits an
30 identification number for the second vehicle wheel communication device to the vehicle body communication device via the first vehicle wheel communication device.

14. The vehicle wheel information processing device according to claim 13, wherein

each vehicle wheel communication device transmits a value detected
5 by the sensor,

the vehicle body communication device determines which of the signals has been transmitted from which of the vehicle wheel communication devices based upon the detected values transmitted from a plurality of vehicle wheel communication devices.

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15. The vehicle wheel information processing device according to claim 13, wherein

a transmission pattern of the signal transmitted from the first vehicle wheel communication device is different from a transmission pattern of
15 the signal transmitted from the second vehicle wheel communication device.

16. The vehicle wheel information processing device according to claim 13, wherein

20 the first vehicle wheel communication device transmits the signal at a transmission cycle which is different from a transmission cycle at which the second vehicle wheel communication device transmits the signal.

17. The vehicle wheel information processing device according to any one
25 of claims 13 to 16, wherein

the single wheel is provided with a first detection sensor that detects first vehicle wheel information, and a second detection sensor that detects second vehicle wheel information, the first detection sensor being included in the first vehicle wheel communication device, and the second detection
30 sensor being included in the second vehicle wheel communication device.

18. The vehicle wheel information processing device according to claim 17, wherein

the vehicle body communication device transmits a request signal to the first vehicle wheel communication device, and

in response to the transmitted request signal, the first vehicle wheel communication device (i) transmits a first signal including the detected
5 first vehicle wheel information and an identification number for the first vehicle wheel communication device, and (ii) transfers the request signal to the second vehicle wheel communication device, and

in response to the transferred request signal, the second vehicle wheel communication device transmits a second signal including the
10 detected second vehicle wheel information and an identification number for the second vehicle wheel communication device to the first vehicle wheel communication device, and

the first vehicle wheel communication device transmits the second signal from the second vehicle wheel communication device to the vehicle
15 body communication device.

19. The vehicle wheel information processing device according to claim 17 or 18, wherein

the first vehicle wheel information is information that is different to
20 that of the second vehicle wheel information.

20. The vehicle wheel information processing device according to any one of claims 13 to 19, wherein

the vehicle wheel includes a wheel and a tire attached to an outer
25 periphery of the wheel, and

one of the first and the second vehicle wheel communication devices is provided at the wheel, and the other of the first and the second vehicle wheel communication devices is provided at the tire.

30 21. The vehicle wheel information processing device according to claim 20, wherein

the first vehicle wheel communication device is provided at the wheel, and the second vehicle wheel communication device is provided at the tire.

22. A vehicle wheel information processing method for receiving and processing vehicle wheel information from a plurality of vehicle wheel communication devices provided at a single wheel and not connected to each other, the method comprising:

a first step in which respective signals of each of the vehicle wheel communication devices are wirelessly transmitted to a vehicle body communication device using a transmission pattern that is different for each vehicle wheel communication device; and

a second step in which the respective signals wirelessly transmitted from each vehicle wheel communication device are received by the vehicle body communication device.

23. The method according to claim 22, further comprising:

a third step in which a request signal from the vehicle body communication device is transmitted to the vehicle wheel communication devices, wherein

each vehicle wheel communication device transmits the signal in response to the request signal.

24. The method according to claim 22 or 23, further comprising:

a fourth step in which the vehicle body communication device determines which of the signals has been transmitted from which of vehicle wheel communication devices based on the respective transmission patterns.